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During the Summer Session of the University of Illinois, June 17 to August 9, 1912, the following mathematical courses will be offered: Advanced algebra, plane trigonometry, analytic geometry, differential calculus, integral calculus, differential equations, and projective geometry. Graduate credit may be granted only for work in the last two of these courses. M.

It may interest mathematicians to learn of a valuable series of card-catalogue cards which the Library of Congress will have ready for distribution next July. This series is the beginning of a Dictionary Catalogue of all articles in the *Encyklopädie der Mathematischen Wissenschaften* and *Encyclopédie des Sciences Mathématiques*. Brown University has already supplied copy for the catalogue of all parts of these works which have been published. It will continue to furnish copy for further cards as the various parts of the encyclopædias appear. R. C. ARCHIBALD.

The latest number of the *Revue Semestrielle*, covering the period of six months from April to October, 1911, classifies the mathematical literature which appeared during this period under about 250 different headings, excluding the sub-headings represented by small letters of the Roman and the Greek alphabets. The largest number of references appear under the headings of biography and various considerations on the philosophy and the teaching of mathematics. The other headings under each of which there are more than twenty references to literature appearing during the given six months are as follows: Functions of real variables, series and infinite developments, electrodynamics, thermodynamics, light, surfaces in general and lines traced on a surface, theory of equations, functional equations, calculus of probability, systems and families of surfaces, elasticity, determinants, integral calculus, algebraic and circular functions, particular linear differential equations, indeterminate analysis of order higher than the first, plane and spherical curves, dynamics of solids and of material systems, rational hydrodynamics, and the history of mathematics in the twentieth century. The numbers of these references are useful to determine the fields of greatest present mathematical activity. Other facts must, however, be also considered. M.

BOOKS.

Non-Euclidian Geometry. A Critical and Historical Study of Its Development. By Roberto Bonola, Professor in the University of Pavia. Authorized English translation with additional appendices, by H. S. Carslaw, Professor in the University of Sydney, N. S. W., with an introduction by Federigo Enriques, Professor in the University of Bologna. 8vo. Red cloth. xii+263 pages. Price, \$2.00. Chicago: The Open Court Publishing Co.

This is, as it purports to be, a critical and historical study of non-Euclidean geome-

try. The first chapter deals with attempts to prove Euclid's parallel postulate, beginning with the Greeks, Euclid, Proclus, etc., and ends with the investigations of Wallis. The second chapter treats of the forerunners of non-Euclidean geometry, beginning with Gerolamo Sacchiri and ends with Wachter and Thibaut. Thibaut is alleged to be responsible for the erroneous proof of the angle-sum, by starting at one corner of a triangle and running the side along in its own trace until the next vertex is reached, then turning the side through an angle until it coincides with next adjacent side, and so on. Chapters III and IV deal with the founders of non-Euclidean geometry, beginning with Gauss and Bolyai and ending with Battaglini and Beltrami. Chapter V. has to do with the later developments of non-Euclidean geometry. In the five appendices are treated in order, The fundamental principles of statics and Euclid's postulate, Clifford's parallels and surface and sketch of Clifford-Klein's problem; the non-Euclidean parallel construction and other allied constructions; the independence of projective geometry from Euclid's postulate; and the impossibility of proving Euclid's parallel postulate. The book gives a most satisfactory treatment of the subject and will be welcomed by all interested teachers of Geometry. The publishers have done their part well in presenting this translation to English speaking mathematicians. F.

An Elementary Treatise on Statics. By S. A. Loney, M. A., Professor of Mathematics at the Royal Holloway College (University of London). Sometime Fellow of Sydney Sussex College, Cambridge. Large 8vo. Red Cloth. viii+393 pages. Price, \$4.00 net. Cambridge, Eng.: The University Press. G. P. Putnam's Sons, American Agents.

This book is intended to serve as a companion to the author's excellent treatise on *Dynamics of a Particle and of Rigid Bodies*. It covers most of the usual subjects of Statics and requires on the part of the student a knowledge of the calculus and of solid geometry. A large collection of interesting problems are placed at the end of each chapter and after many of the articles. The treatment of the various subjects is in keeping with all the other works which Professor Loney has written. There is one thing, however, which most, if not all of his works lack, and that is a good index. The typography and binding is all that could be desired. F.

Kimball's Commercial Arithmetic. Prepared for use in Normal, Commercial, and High Schools and for the Higher Grades of the Common Schools. By Gustavus S. Kimball, Author of *Business English*, *Word Book*, *Business Speller*, etc.. 8vo. Cloth and Leather back. viii+418 pages. New York: G. P. Putnam's Sons.

A very good book for the commercial student. All the ordinary business transactions, such as Banking, Stocks and Bonds, and Insurance, are quite fully treated.

As is the usual way in books of this kind, many useful short-cuts for rapid calculation are clearly explained and illustrated by numerous illustrative examples. Of course, short-cuts are of little value educationally, but are useful to the accountant. The book is well conceived and well arranged. The answers are bound in a separate volume. F.

The Modern Locomotive. By C. Edgar Allen, A. M. I. Mach. E.; A. M. I. E. E. Small 8vo. Cloth, ix+174 pages. Cambridge, Eng.: The University Press. G. P. Putnam's Sons, American Agents.

This little volume is one of the Cambridge Manuals of Science and Literature. Its object is to sketch the general "principles governing the design and working of a modern locomotive and to trace the broad lines of development from its comparatively simple predecessor of twenty-five or thirty years ago." Much attention is given to combustion, transfer of heat, steam production, super heating, compounding, feedwater heating, resistance and stability. It has many valuable suggestions for the engineer. F.